It is therefore with great pleasure that we welcome Dr. v. Monckhoven's "Traité Général," which seems to omit nothing in the way of recent additions to the number of photographic processes.

The Doctor commences his book with an historical notice of the origin of the art, in the course of which the irrepressible Egyptians make their appearance as having undoubtedly observed the effects of light on certain bodies; but, unfortunately, they have not handed their experience in the matter to posterity. The Egyptians and Greeks, however, having been disposed of, we have sixteen pages of really very useful historical matter, so arranged that a short paragraph is devoted to each of the more important processes, and which is rendered still more valuable by numerous references to the original papers of the various investigators to whom we owe the art.

The author then proceeds to give a sketch of the nature of light. Perhaps in a treatise of this sort one cannot expect a very comprehensive definition of such a subject. Still, however, something more satisfactory than the following might have been expected . . . . "il existe nécessairement entre le soleil et nous, un certain mode de communication dont nos yeux sont l'intermédiare; c'est ce mode de communication qui constitue ce que l'on appelle la *lumière*."

We then have a sketch of the chemical action of light, and a very good description of what a photographic laboratory ought to be, but, we fear, very rarely is. Considerable space is devoted to a description of the method of preparing the various substances required, including gun-cotton and collodion; and here we may observe that Dr. van Monckhoven makes use of the old system of chemical equivalents obsolete in England, and very nearly so on the Continent, a proceeding which is to be regretted in a work which is likely to remain for some time a standard book on its subject. We have noticed that photographers are singularly conservative on this point, for, to the best of our belief, there is not even now a photographic journal which makes use of the present atomic system of notation, a system which even nine years ago was largely used by chemists. A really admirable chapter, on photographic optics succeeds that on photographic chemistry; one soon perceives how much the art has owed to the lenses constructed on the formulæ of Dallmeyer and Steinheil, and to the credit of English opticians we find that in the summary the lenses of the former are stated to surpass all others.

After dealing with cameras, printing frames, studios, and every other photographic requisite, the various processes are dealt with at length. Here we may note that specimens are given of two of the more recent mechanical printing processes the "Woodburytype," and "Heliotype." Both are pigment methods, and so are not liable to the slow fading inevitable to the ordinary prints containing silver. Of them we can only say that while it is difficult to imagine that any process can surpass the former for artistic effect, the latter seems equally unsurpassable for any purpose requiring excessively minute and faithful reproduction of fine detail, such as is required in copying maps, prints, or diagrams.

A specimen of what is modestly termed the "retouche des clichés," is also given, but here we feel that we are treading on dangerous ground, as a portrait of a lady is the subject. Suffice it to say, that the general effect of this process seems to be like that of the elixir vitæ, and to make the happy patient young and handsome again.

We find considerable information also on photographic enamelling, and on the production of enlargements, where we observe that the heliostat and its use are described.

The work is illustrated with 280 woodcuts, executed in a style which is only found in foreign scientific works, and three specimen photographs are also given. In conclusion we must congratulate Dr. van Monckhoven on the production of so useful a book, hoping only that the chemical portion will be modernised and extended in future editions. Why do not some of our many amateur or professional photographers devote some attention to the chemical nature of their art? Of the rationale of many of the reactions we know absolutely nothing, and of the others our knowledge is not much greater. Such a research would not be of theoretical value only, but would materially aid in the attainment of that perfect application of means to ends by which alone the best results either in art or science can be obtained.

OUR BOOK SHELF

The Relations of the Air to the Clothes we wear, the Houses we live in, and the Soil we dwell on. Three popular lectures delivered before the Albert Society at Dresden. By Dr. Max von Pettenkofer, Professor of Hygiene at the University of Munich, &c. Abridged and translated by Augustus Hess, M.D., Member of the Royal College of Physicians, London, &c. (London: Trübner and Co., 1873.)

DR. HESS has done well in translating these lectures by so great an authority on hygiene as Dr. Pettenkofer. Though the author does not believe that any knowledge of real value can be imparted by means of popular lectures, still they serve a good purpose in the way of "scientific edification and elevation, which are to raise our minds and hearts and to affect us like listening to good music." Though we in this country have perhaps less need to be instructed in the rules of hygiene than the mass of people on the Continent, still, it will be universally admitted that very few are acquainted with the principles which underlie healthy living, and still fewer can be at the trouble to put them into practice. In the little volume before us, which is well translated by Dr. Hess, the author expounds in an interesting and yet thoroughly scientific manner, the *rationale* of healthy living so far as our relations to the air are concerned, and shows the scientific principles on which we should choose our clothes both as to material and make, and which should guide us in building our houses. In the third lecture he speaks of the relations of the air to the soil, or on the Ground-air, and shows how much remains to be done before the principles of hygiene and their practical application can reach anything like perfection. The following extracts will give an idea of Dr. Pettenkofer's method of treatment:—

With regard to Clothing, the author says:—"When exposed to *luminous heat*, the *materials* of our clothing do not show very great differences, but in experimenting on shirtings of different *colours*, the following result was obtained:—When white absorbed 100, pale straw colour absorbed 102, dark yellow 140, light green 155, dark green 168, Turkish red 165, light blue 198, black 208. In the shade these differences nearly vanish. Krieger, in experimenting on tin cylinders filled with warm water, has found that a double tight covering by the same material does not retard the heat loss much more than a single one; but when the outer layer was

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loose it retarded it very much. From this follows the practical truth, that we can produce a very different effect by the same number of clothes according to their make.

"Generally our clothing has been considered as an apparatus for keeping the air from us. This conception is utterly erroneous, and we can bear no garment which does not allow of a continual ventilation of our surface. Just those textures which are most permeable to the air keep us warmest. I have examined different materials for their permeability to air, and taking the permeability of air passing through flannel as 100, linen allowed 58, silk 40, buckskin 58, chamois 51, kid 1 part of air to pass through them. If the above-stated notion were correct, kid would keep us 100 times, chamois warmer by half, than flannel, and so on, while everyone knows that it is quite the reverse."

With reference to Fur the author says:—"A fur is so arranged that its fine hair projecting into the air intercepts all the heat which flows from the surface of the body by radiation and conduction, and distributes this heat through the air which circulates between the single hair-cylinders. Thus the air, however cold it may be, reaches the nerves of our skin as a warmed air. Furred animals in winter, when touched superficially, give a very cold sensation; it is only near the skin that their hair feels warm. In a severe cold, certainly little of our animal heat comes as far as the points of the hair, from which it would escape by radiation or conduction, as the current of air in the fur cools the hair from its points towards its roots, and a severe cold penetrates only a little farther into the fur, without reaching the skin of the same. This can take place only at an exceedingly low temperature, or when a very cold air is in violent motion. In a well-furred animal the changes of temperature in the surrounding air only change the latitudes at the cold and warm zones in the fur; the place where the temperature of the body and the air equalise each other, moves between the roots and points of the hair, and for this reason a furred animal is not warmer in summer than in winter. In summer its heat leaves at the points, in winter near the roots of the hair."

Journal of the Proceedings and Annual Report of the Winchester and Hampshire Scientific and Literary Society, vol. i., part ii. 1871-2 (Winchester: Warren and Son, 1873).

WE are glad to see from the Third Annual Report of this Society that it continues prosperous, the number of members being, in 1872, 105. We hope good use will be made of the valuable herbarium of flowering plants, ferns, lichens, &c., collected and arranged by the late Mr. Hill, which has come into the possession of the society, through the generosity of the Mayor, Mr. R. P. Forder, and the President. The present part of the journal contains a number of papers, literary and scientific, read at various meetings of the society. The principal one is the Introductory Address delivered at the commencement of the third session, by the Rev. Canon Kingsley, on "Bio-Geology—the science which treats of the distribution of plants and animals over the globe, and the causes of that distribution." The address is an eloquent one, it can easily be imagined, shows extensive knowledge and great shrewdness, and contains many valuable hints both to young and old naturalists. Most of the other papers are also by clergymen, the principal ones being the following:—"On the Dawn of Thought in Greece," by the Rev. W. Awdry; "On the Metamorphosis of Lepidoptera," by Mr. J. Pamplin; "the Planet Jupiter," by the Rev. E. Firmstone, in which the author gives many interesting facts and speculations as to the condition of that planet; "Vesuvius previous to and during the Eruption of 1872," by the Rev. C. A. Johns, in which the author describes an ascent he made shortly before the last eruption, and appends a condensed abstract of Palmieri's account of the eruption. Appended to the journal is a valuable list of 315 works on the Geology, Mineralogy, and Palæontology of the Hampshire Basin, compiled by Mr. William Whitaker, of the Geological Survey.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

Wyville Thomson and the Ventriculidæ

I TRUST that you will afford me a little space for a few remarks upon some passages in Prof. Wyville-Thomson's book, the "Depths of the Sea," which, owing to many engagements, has only just come into my hands. So earnest a labourer in the wide field of truth will not, I hope, deem me discourteous if I point out one corner where his feet have slipped; and if it be objected that, after all, it is only in a small spot, the learned Professor will, I am sure, agree with the answer that, even in the smallest steps towards truth, attainable accuracy is important.

In 1847-48 my father published a series of papers in the "Annals and Magazine of Natural History," which were afterwards collected into a volume, on the "Ventriculidæ of the chalk, their microscopic structure, affinities, and classification." This work, which still remains, I believe, the authority on its subject, introduced order and classification where before all was confusion, expressly founding these upon two guiding principles of anatomy, the existence of which had been proved by searching tests. These two principles—the first being the structure, the second the fold, of the membrane—I am careful to recall, as I think there is considerable misapprehension regarding them. The chief locality of these fossils was in the south and west of England.

In his chapter on the Continuity of the Chalk, Prof. Thomson brings forward several families of ancient fauna as palæolontological evidence in support of his argument. Among these he devotes some attention to the Ventriculidæ (he calls them *Ventriculites*, but why? In the same sentence he uses the family name *Hexactinellidæ*); but, though he acknowledges my father's work, and refers to his "minute and most accurate description of their structure," it does not appear by what follows that he has quite comprehended it: "He (Mr. Toulmin Smith) found them to consist of tubes of extreme tenuity, delicately meshed, and having between them interspaces usually with very regular cubial or octohedral forms" ["Depths," &c p. 482]. This description (the Professor will forgive me for saying so) does not convey a very clear idea of any structure, and certainly does not apply to the Ventriculidæ: if the word "tube" here means the body of the creature, it may in one sense be partially true of a few species in each of the genera—*Ventriculites*, *Cephalites*, and *Brachiolites*; but if it is intended to apply to the substance of the structure, I must say that it denotes a complete error. My father's words are, that "the membrane of the Ventriculidæ is composed of very delicate fibres," "the fibre is single and solid, never fistular," and that in this structure "*there are no tubes whatever*" (pp. 21, 25, 30). My father carefully describes this membrane, and marks it as the essential characteristic of the whole family of Ventriculidæ. Among the thirty-five species, for the most part marked by strong differences, he points out that *Ventriculites simplex* is the type of the whole family, consisting of a single membrane without a trace of fold.

Now, Prof. Thomson gives a figure of the octohedral structure to which I will not take exception, but he writes underneath it, "*Ventriculites simplex*, Toulmin Smith. Section of the outer wall, showing the structure of the silicious net-work." This implies, while citing my father's name (1) that this structure is proper to that species; and (2) that there is an inner wall. It also speaks of the net-work as silicious, while, two pages before, it is said, that "Mr. Toulmin Smith supposed that the skeleton of the Ventriculite had been originally calcareous." But though mistakes of this sort might easily arise through misapprehension, I must say I was very much astonished to see the figures, one of the entire fossil, the other of the "outer surface," given as "*Ventriculites simplex, Toulmin Smith*," from Mr. Sanderson's collection ("Depths," &c., pp. 483, 484.) A glance at Fig. 1, on the second plate in my father's book, will show that the name

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